CLAIMS

1. A light valve consisting of:
two cover layers,
at least one of which is transparent,
and an optically active layer between these cover layers,
with the optically active layer consisting of:
a polymer dissolved in a solvent,
with the polymer and the solvent reversibly forming finely divided separate phases upon heating to a specific temperature,
thereby reversibly turning the optically active layer from relatively transparent to relatively opaque,
characterized in that:
most of said polymer is formed between said cover layers by polymerizing a monomer which is dissolved in said solvent.

2. The light valve of Claim 1,characterized in that:
said monomer is at least 15% soluble in said solvent at a temperature low enough that the heat of polymerization of said monomer does not raise to its phase separation temperature the solution consisting of said solvent, plus said monomer, plus the said polymer which is in the process of being formed from said monomer.

3. The light valve of Claim 1,characterized in that:
a crosslinking monomer, with a functionality of two or more, and which copolymerizes with said monomer, and which is soluble in the solution of said solvent plus said monomer, and which is added so that said polymerization forms a crosslinked gel.

4. The light valve of Claim 1, characterized in that:
said solvent is primarily water.

5. The light valve of Claim 1, characterized in that:
said monomer's polymerization is rapid, repeatable, and relatively complete, due to its conjugated unsaturation.

6. The light valve of Claim 5, characterized in that:
said conjugated unsaturation is acrylamide.

7. The light valve of Claim 6, characterized in that:
said acrylamide is N-substituted, and may have a saturated hydrocarbon group substituted onto an unsaturated carbon atom.

8. The light valve of Claim 7, characterized in that:
said N-substituted group or groups are saturated hydrocarbons, and said monomer's total number of carbon atoms is between 5 and 7.

9. The light valve of Claim 8, characterized in that:
more than half of said monomer is N- diethyl acrylamide and/or N- diethyl methacrylamide.

10. The light valve of Claim 1, characterized in that:
said monomer is a mixture of monomers which are selected and proportioned such that the light valve switches at a desired temperature.

11. The light valve of Claim 10, characterized in that:
said mixture of monomers forms a copolymer that is relatively random.

12. The light valve of Claim 1, characterized in that:
said polymer chains do not have many non-chemical interchain bonds which reversibly crosslink the chains.

13. The light valve of Claim 1, characterized in that:
the backbone of said polymer is relatively free from stearic hindrance and is flexible when dissolved in said solvent in order for said polymer's phase separation with said solvent to occur over a narrow temperature band.

14. The light of Claim 1, characterized in that:
said polymer formed does not react with said solvent, and/or oxygen, and/or sunlight.

15. The light valve of Claims 1 or 3, characterized in that:
the catalyst for said polymerization, and preferably also for said crosslinking monomer, is a reducer plus oxidizer.

16. The light valve of Claim 15, characterized in that:
said catalyst is a persulfate salt plus a metabisulfite salt.

17. The light valve of Claim 1, characterized in that:
the light valve is stabilized against aging by oxygen and/or ultraviolet light by the addition of a hindered amine stabilizer which is soluble in said polymer dissolved in said solvent.

18. The light valves of Claims 1 through 17, characterized in that:
they are used to make architectural glazings that control unwanted solar heat or glare.

19. A sealant made from a saturated hydrocarbon rubber polymer characterized in that:
the polymer has an average functionality of two or more in order to form crosslinks, optionally by reacting said polymer functionality with a crosslinker which has a functionality of two or more,
and which is soluble in said polymer.

20. The sealant of Claim 19, characterized in that:
said polymer functionality is hydroxy.

21. The sealant of Claim 19, characterized in that:
said crosslinker functionality is isocyante.

22. The sealant of Claim 21, characterized in that:
said isocyanate is trimethyl hexamethylene diisocyanate.

23. The sealant of Claim 19, characterized in that:
a hindered amine stabilizer with functionality that chemically bonds it to said polymer, is added.

24. A process for making light valves consisting of:
forming a seal between two cover sheets at the circumference of the smaller sheet, optionally with fill and vent ports in the seal,
and with the seal spacing apart the cover sheet,
thus forming a cavity,
characterized by:

injecting into said cavity a liquid which then becomes a solid layer,
with the solid layer having a variable transmission of light.

25. The process of Claim 24, characterized in that:
any of the previously claimed materials are used.

26. The process of Claim 24, characterized in that:
said liquid consists primarily of a monomer solution.

27. The process of Claim 24, characterized in that:
said cover sheets are etched to improve the adhesion between said cover sheet and said solid layer.

28. The process of Claim 24, characterized in that:
a silane is applied to said cover sheet to improve the adhesion between said cover sheet and said solid layer.

29. The process of Claim 28, characterized in that:
said silane is a vinyl silane.

30. The process of Claim 28, characterized in that:
said cover sheets are heated to bond said silane to said cover sheets.

31. The process of Claim 24, characterized in that:
said cover sheets joined with said seal are cooled before and/or during said injecting and/or the said liquid becoming said solid, in order to prevent the heat thereby released from reducing said light valve's optical performance or resistance to aging.

32. The process of Claim 24, characterized in that:
said liquid is cooled before said injecting in order to prevent the heat released from said liquid becoming said solid from reducing said light valve's optical performance or resistance to aging.

33. The process of Claim 24, characterized in that:
said cavity is flushed with an inert gas before said liquid is injected into said cavity to prevent incomplete polymerization, or bubble formation in said solid.

34. The process of Claim 33, characterized in that:
the inert gas is selected from: nitrogen, argon, and preferably helium.

35. The process of Claim 24, characterized in that:
dissolved gases are removed from said liquid before it is injected into said cavity to prevent incomplete polymerization, or bubble formation in said solid.

36. The process of Claim 24, characterized in that:
the liquid components of said liquid have synchronized metering pumps in order to have a constant ratio between said components, and to fill said cavity with the desired volume of said liquid.

37. The process of Claim 24, characterized in that:
said liquid is injected into said cavity through slot die(s) or hollow needle(s).

38. The process of Claim 24, characterized in that:
a tilting top table, with optional cooling, is used to help prevent, or to remove bubbles from said liquid in said cavity before it becomes said solid.

39. The process of Claim 24, characterized in that:
said seal is made from a two-sided tape or a ribbon of adhesive.

40. The process of Claim 24, characterized in that:
said seal is made from a sealant that softens upon heating, and becomes a solid again on cooling.

41. The process of Claim 40, characterized in that:
said two cover sheets with said sealant placed between them are placed in a flat or roller press which is heated in order to soften and compress said sealant in order to form the desired spacing between said cover sheets, and to bond said sheets together.

42. The process of Claim 24, characterized in that:
after said liquid has become said solid, an outer seal is formed outside said seal to form a durable mechanical connection between said two cover sheets, and optionally to cover said fill and vent ports, and optionally to prevent loss of liquid components of said solid layer.

43. The process of Claim 42, characterized in that:
said outer seal is made from a sealant that melts upon heating for application as a liquid, and becomes a solid again on cooling.

44. The process of Claim 42, characterized in that:
said outer seal is made with a sealant based on a saturated hydrocarbon liquid or solid polymer, with functionality for crosslinking.

45. The process of Claims 19 through 23, and 42, characterized in that:
said outer seal is made from the sealants previously claimed.

46. The process of Claim 24, characterized in that:
said light valve is made on production machinery that has been designed for making sealed double pane windows, and that has been modified for making said cavity thinner, and has been added on to enable injecting said liquid into said cavity.

47. The processes of Claims 24 through 46, characterized in that:
they are used to make architectural glazings that control unwanted solar heat or glare.